

Introduction to Botany. Lecture 4

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Outline

1 Questions and answers

2 Chemistry of life

- Very basics of chemistry



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Last question

How many protons are in the nucleus of silicon (Si) atom?



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Atomic weight 28.086 means that most likely there are 28 and 29 isotopes: ^{28}Si and ^{29}Si

14 is a number = 14 protons = 14 electrons

Isotope I has: $28 - 14 = 14$ neutrons

Isotope II has: $29 - 14 = 15$ neutrons



Chemistry of life

Very basics of chemistry



Very basics of chemistry

☑ Atoms

- ☑ Protons
- ☑ Neutrons
- ☑ Electrons

☑ Atomic weight

☑ Isotopes

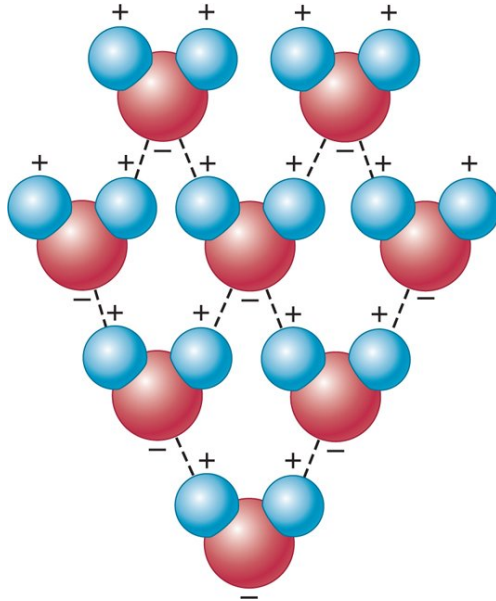
☑ Elements

☑ Periodic table: rows and columns

- Chemical bonds: ionic, covalent, hydrogen
- Valence and group
- Molecules
- Molecular weight



Water with hydrogen bonds



Acids and bases. Ions

- Acids: take out H^+ (proton), like
 $\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$
- Bases: take out OH^- (hydroxyl)
 $\text{NaOH} \rightarrow \text{Na}^+ + \text{OH}^-$



Molar mass and molar concentration

- Molar mass is a gram equivalent of molecular mass
- For example, molecular mass of salt (NaCl) is $23 + 35^1 = 58$ Da. We take “Da” out and replace it with “g” (grams). Therefore, 1 mole of salt is 58 g.
- Every mole contains $6.02214078 \times 10^{23}$ molecules (Avogadro's number)
- Concentration is the density of dissolved substance
- In water solution, 1 M (1 molar) concentration of salt means that in 1 liter of distilled water 58 g of salt was diluted
- If we take half of this water, concentration will still be 1 M whereas amount of diluted salt will decrease twice

¹ If we accept that atomic mass of chlorine is 35.



Summary

- Most important bonds: polar and non-polar covalent (intramolecular) and hydrogen (intermolecular)



For Further Reading



A. Shipunov.

Introduction to Botany [Electronic resource].

2015.

Mode of access:

http://ashipunov.info/shipunov/school/biol_154

